CLAIMS:

Add A2

1. A multiple working range optical system comprising an optical assembly having first and second optical elements and associated respective first and second narrow band optical filters for producing narrow band images of objects at respective first and second working ranges.

2. A system according to claim 1 including a selectable filter array having first and second selectable filters, and a switch mechanism for selecting the first or second working ranges, whereby:

(a) when the first working range is selected, light from an object is imaged by the first optical element in a narrow band defined by the first narrow band optical filter and the first selectable filter; and

(b) when the second working range is selected, light from an object is imaged by the second optical element in a narrow band defined by the second narrow band optical filter and the second selectable filter.

3. A system according to claim 1 wherein the selectable filter array comprises a plurality of movable filters.

4. A system according to claim 1 wherein said first and second optical elements are arranged to image objects at their respective working ranges at a coincident image plane.

5. A system according to claim 4 including a photographic film at said image plane.

6. A system according to claim 4 including a charge-coupled-device array at said image plane.

7. A system according to claim 1 including a multi-focus lens defining said first and second optical elements.

8. A system according to claim 7 wherein said multi-focus lens is circular, said first and second optical elements comprising respective segments of said lens.

9. A system according to claim 1 wherein said first and second optical elements comprise first and second refracting lenses.

10. An optical reader for reading indicia including a multiple working range optical system according to any one of the preceding claims.

11. A bar code scanner including a multiple working range optical system according to any one of claims 1 to 9.

12. An optical scanner for reading indicia comprising a housing, a beam generator and scanner within the housing for producing a scanning light beam, a window in the housing allowing the light beam to exit the housing toward an indicia to be read, and a light detector defecting reflected light for said indicia; the housing having a strap for positioning around the neck of a user whereby the scanner may be worn as a pendant.

13. A scanner according to claim 12 wherein said housing defines a front surface and a rear surface, said window being in said front surface, such that said light beam is directed outwardly, away from said user, when the scanner is being worn as a pendant.

14. A scanner according to claim 12 wherein said light beam is directed outwardly and downwardly when the scanner is being worn as a pendant.

15. An optical scanning station having a conveyor for moving articles carrying indicia to be read past a support, the support being arranged to hold an optical scanner in an elevated position, above said conveyor, said optical scanner having a beam generator and scanner for producing a scanning light beam, said beam being directed downwardly to read indicia on articles that pass on said conveyor under said optical scanner.

16. An optical scanning station according to claim 15 wherein the support comprises an arch over said conveyor.

17. An optical scanning station according to claim 15 wherein said optical scanner is detectable from said support for use in a hand-held mode.

18. A point of sale station including an optical scanning station according to any one of claims 15 to 17.

19. An optical scanner having first and second lasers for producing respective first and second laser beams, a laser controller for pulsing the lasers, a scanning mechanism for receiving the laser beams and for directing the beams toward an indicia to be read, a detector for detecting light reflected from the indicia and for producing electrical signals representative thereof, and a signal separator for extracting from the electrical signals first and second output signals representative respectively of reflections from the indicia of the first and second laser beams.

20. An optical scanner according to claim 19 wherein said signal separator is a sampler and demultiplexer.

21. An optical scanner according to claim 19 including first and second decoders for attempting to decode, simultaneously, said first and second output signals.

22. An optical scanner according to claim 19 in which the laser controller alternately pulses the lasers.

23. An optical scanner according to claim 19 in which the laser controller pulses the lasers at differing frequencies.

24. An optical scanner according to claim 23 wherein said signal separator includes a bandpass filter.

25. An optical scanner according to claim 19 arranged to detect an indicia at a first working distance using the first laser beam and to detect an indicia at a second working distance using the second laser beam.

26. An optical scanner according to claim 19 wherein said lasers are pulsed at a frequency which is greater than twice the highest frequency to be found in the electrical signals produced by the detector.

27. A multi scan-pattern optical scanner including a laser assembly for producing a plurality of laser beams of differing wavelengths and a scanning mechanism including a wavelength selector for selectively passing a beam of predefined wavelength thereby producing at least a first scan pattern from a beam which is passed by the selector and a second scan pattern from a beam which is stopped by the selector.

28. A scanner according to claim 27 wherein the wavelength selector includes a wavelength-selective coating.

29. A scanner according to claim 28 wherein the coating is arranged to pass at least one of the laser beams and to absorb at least another of the laser beams.

30. A scanner according to claim 28 wherein the coating is a mirror coating.

31. A scanner according to claim 30 wherein the coating is applied to a moving mirror.

32. A scanner according to claim 30 wherein the coating is applied to a stationary mirror.

33. A scanner according to claim 30 wherein the scanning mechanism includes a moving assembly having a plurality of mirror elements, the coating being applied to some but not all of the elements.

34. A scanner according to claim 33 wherein the moving assembly comprises a rotating polygon.

35. A scanner according to claim 30 wherein the scanning mechanism includes a stationary assembly having a plurality of mirror elements, the coating being applied to some but not all of the elements.

36. A scanner according to claim 35 wherein the stationary assembly includes a crown-arrangement of mirror elements.

37. A scanner according to claim 27 wherein the laser assembly includes first and second lasers.

38. A scanner according to claim 27 including laser optical assemblies for focusing the laser beams for effective scanning of indicia at different respective working distances.

39. A method of reading optically encoded information comprising the steps of:

(a) providing first and second different laser beams;

(b) illuminating with said laser beams a field of view including encoded information;

(c) detecting light resulting from said first and second laser beams being reflected from the field of view; and

(d) deriving from said detected light the encoded information.

40. A method according to Claim 39 wherein the first and second laser beams are of differing frequencies.

41. A method according to Claim 39 wherein the first and second laser beams are pulsed so that at any time only a single beam illuminates the field of view.

42. A method according to Claim 41 wherein each beam pulse is of sufficient duration to permit scanning of an entire symbol.

43. A method according to Claim 39 wherein said first and second laser beams are scanned across said field of view, said first beam being scanned in a first direction and said second beam being scanned in a second, different, direction.

44. A method according to Claim 39 wherein said deriving step uses data from reflection of both said first and said second beams.

45. A method of reading optically encoded information comprising the steps of:

illuminating a field of view including encoded information;

sensing light reflected from two regions in the field of view to simultaneously produce two data streams related to the detected light intensity in the respective two regions in the field of view; and

deriving a single decoded representation of the optically encoded information from the two data streams.

46. A method according to Claim 45 wherein the light reflected from one of said regions is of a different frequency from the light reflected from the other of said regions.

47. A method according to Claim 45 wherein the field of view is illuminated by pulsed light, light reflected from one of said regions being pulsed at a different frequency from light reflected from one of said regions being pulsed at a different frequency from light reflected from the other of said regions.

48. A method according to Claim 45 wherein said two regions overlap.

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add C1